

# Dell™ Vostro™ V13 Service Manual

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## Notes, Cautions, and Warnings



**NOTE:** A NOTE indicates important information that helps you make better use of your computer.



**CAUTION:** A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.



**WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

If you purchased a Dell™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

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# System Setup

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- [Entering System Setup](#)
- [System Setup Screens](#)
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## Overview

Use System Setup as follows:


- 1 To change the system configuration information after you add, change, or remove any hardware in your computer
- 1 To set or change a user-selectable option such as the user password
- 1 To read the current amount of memory or set the type of hard drive installed

Before you use System Setup, it is recommended that you write down the System Setup screen information for future reference.

 **CAUTION:** Unless you are an expert computer user, do not change the settings for this program. Certain changes can make your computer work incorrectly.

## Entering System Setup

1. Turn on (or restart) your computer.
2. When the blue DELL™ logo is displayed, you must watch for the F2 prompt to appear.
3. Once this F2 prompt appears, press <F2> immediately.

 **NOTE:** The F2 prompt indicates that the keyboard has initialized. This prompt can appear very quickly, so you must watch for it to display, and then press <F2>. If you press <F2> before you are prompted, this keystroke will be lost.

4. If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop. Then, shut down your computer and try again.

## System Setup Screens

|                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Menu</b> — Appears on top of the System Setup window. This field provides a menu to access to the System Setup options. Press <\xdf> and < > keys to navigate. As a <b>Menu</b> option is highlighted, the <b>Options List</b> , lists the options that define the hardware installed on you computer.                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                     |
| <b>Options List</b> — Appears on the left side of the System Setup window. The field lists features that define the configuration of your computer, including installed hardware, power conservation, and security features.<br><br>Scroll up and down the list with the up- and down-arrow keys. As an option is highlighted, the <b>Options Field</b> displays the option's current and available settings. | <b>Options Field</b> — Appears on the right side of <b>Options List</b> and contains information about each option listed in the <b>Options List</b> . In this field you can view information about your computer and make changes to your current settings.<br><br>Press <Enter> to make changes to your current settings. Press <ESC> to return to the <b>Options List</b> .<br><br><b>NOTE:</b> Not all settings listed in the Options Field are changeable. | <b>Help</b> — Appears on the right side of the System Setup window and contains help information about the option selected in <b>Options List</b> . |
| <b>Key Functions</b> — Appears below the <b>Options Field</b> and lists keys and their functions within the active system setup field.                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                     |

Use the following keys to navigate through System Setup screens:

| Keystroke                         | Action                                                                                         |
|-----------------------------------|------------------------------------------------------------------------------------------------|
| < F2 >                            | Displays information on any selected item in the System Setup.                                 |
| < Esc >                           | Exit from current view or switch the current view to the <b>Exit</b> page in the System Setup. |
| < Up Arrow > or < Down Arrow >    | Select an item to display.                                                                     |
| < Left Arrow > or < Right Arrow > | Select a menu to display.                                                                      |
| - or +                            | Change existing item value.                                                                    |
| < Enter >                         | Select the sub menu or execute command.                                                        |
| < F9 >                            | Load setup default.                                                                            |
| < F10 >                           | Save current configuration and exit System Setup.                                              |

# System Setup Options

## Main

The Main tab lists out the primary hardware features of the computer. The table below defines the function of each option.

| Main            |                                                      |
|-----------------|------------------------------------------------------|
| System Time     | Resets the time on the computer's internal clock.    |
| System Date     | Resets the time on the computer's internal calendar. |
| Bios Version    | Display the BIOS revision.                           |
| CPU Type        | Displays the type of processor.                      |
| CPU Speed       | Displays the speed of the processor.                 |
| CPU Cache Size  | Displays the processor cache size.                   |
| CPU ID          | Displays the processor ID.                           |
| Product Name    | Displays the computer model name.                    |
| Fixed HDD       | Displays the model number of the hard drive.         |
| HDD Size        | Displays the size of the hard drive.                 |
| System Memory   | Displays the total computer memory.                  |
| Extended Memory | Displays the total extended memory.                  |
| Memory speed    | Displays the memory speed.                           |
| AC Adapter Type | Displays the type of the AC adapter.                 |

## Advanced

The Advanced tab allows you to set various boot and DOS-mode functions. The table below defines the function of each option and its default value.

| Advanced                          |                                                                                                                                                                  |                   |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Boot-time Diagnostic Screen       | Enable or disable the system information from being displayed on the screen during power-on self test (POST)                                                     | Default: Disabled |
| QuickBoot Mode                    | Allows the System Setup to skip certain tests during POST which decreases the amount of time needed to boot the computer.                                        | Default: Enabled  |
| Intel® SpeedStep™ Technology      | Allows the clock speed of the processor to be dynamically changed by software while minimizing power draw and heat dissipation.                                  | Default: Enabled  |
| No-Execute Mode Memory Protection | Allows increased protection against buffer overflow attacks.                                                                                                     | Default: Enabled  |
| Intel® Virtualization Technology  | Allows a platform to run multiple operating systems and applications in independent partitions, allowing one computer to function as multiple virtual computers. | Default: Disabled |
| Integrated NIC                    | Enable or disable the power supply to the on-board NIC                                                                                                           | Default: Enabled  |
| WLAN Control                      | Enable or disable the wireless LAN module.                                                                                                                       | Default: Enabled  |
| WWAN Control                      | Enable or disable the wireless WAN module.                                                                                                                       | Default: Enabled  |
| Bluetooth                         | Enable or disable the Bluetooth module.                                                                                                                          | Default: Enabled  |
| USB Outside Ports                 | Enable or disable the the USB ports.                                                                                                                             | Default: Enabled  |
| USB BIOS Legacy Support           | Enable or disable the legacy support for the USB controllers                                                                                                     | Default: Enabled  |
| USB Wake Support                  | Allow USB devices to wake-up the computer from standby. This feature is enabled only when the AC adapter is connected.                                           | Default: Enabled  |
| ExpressCard                       | Enable or disable the ExpressCard slot.                                                                                                                          | Default: Enabled  |
| Card Reader                       | Enable or disable the Card Reader slot.                                                                                                                          | Default: Enabled  |
| Wake On LAN                       | Allows the computer to remotely turned on. This feature is enabled only when the AC adapter is connected.                                                        | Default: Enabled  |
| SATA Mode Selection               | Change the SATA controller mode to either ATA or AHCI.                                                                                                           | Default: AHCI     |
| Camera Control                    | Enable or disable the Camera.                                                                                                                                    | Default: Enabled  |
| Microphone Control                | Enable or disable the Microphone.                                                                                                                                | Default: Enabled  |
| Keyboard Click                    | Enable or disable the keyboard sound.                                                                                                                            | Default: Disabled |

## Security

The Security tab displays the security status and allows you to manage the security features of the computer.

| Security                |                                                                                                                                                                         |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supervisor Password Is  | Specifies whether a supervisor password has been assigned.                                                                                                              |
| User Password Is        | Specifies whether a user password has been assigned.                                                                                                                    |
| Set Supervisor Password | Allows you to set a supervisor password.                                                                                                                                |
| Set User Password       | Allows you to set a user password. You cannot use the user password to enter the BIOS setup, during POST.                                                               |
| Set HDD Password        | Allows you to set a password on the computer's internal hard drive (HDD). The hard drive password is enabled even when the hard drive is installed on another computer. |
| Password on Boot        | Enable or disable authentication every time your computer boots.                                                                                                        |
| Set Service Tag         | Allows you to set a service tag when the system board is replaced.                                                                                                      |
| Service Tag             | Displays the current service tag of the computer.                                                                                                                       |
| Asset Tag               | Displays the asset tag.                                                                                                                                                 |

## Boot

The Boot tab allows you to change the boot sequence.

## Exit

This section allows you to save, discard, and load default settings before exiting from System Setup.

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## Diagnostics

### Dell™ Vostro™ V13 Service Manual

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## Device Status Lights

-  Turns on when you turn on the computer and blinks when the computer is in a power management mode.
-  Turns on when the computer reads or writes data.
-  Turns on steadily or blinks to indicate battery charge status.
-  Turns on when wireless networking is enabled.
-  Turns on when a card with Bluetooth® wireless technology is enabled. To turn off only the Bluetooth wireless technology function, right-click the icon in the system tray and select **Disable Bluetooth Radio**.




## Battery Status Lights

If the computer is connected to an electrical outlet, the battery light operates as follows:

- 1. **Alternately blinking amber light and blue light** — An unauthenticated or unsupported, non-Dell AC adapter is attached to your laptop.
- 1. **Alternately blinking amber light with steady blue light** — Temporary battery failure with AC adapter present.
- 1. **Constantly blinking amber light** — Fatal battery failure with AC adapter present.
- 1. **Light off** — Battery in full charge mode with AC adapter present.
- 1. **Blue light on** — Battery in charge mode with AC adapter present.




## Keyboard Status Lights

The green lights located above the keyboard indicate the following:

-  Turns on when the numeric keypad is enabled.
-  Turns on when the Caps Lock function is enabled.
-  Turns on when the Scroll Lock function is enabled.

## LED Error Codes

The following table shows the possible LED codes that may display in a no-POST situation.

| Appearance                                                                                                   | Description              | Next Step                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ON-FLASH-FLASH</b><br> | No SODIMMs are installed | <ol style="list-style-type: none"><li>1. Install supported memory modules.</li><li>2. If memory is already present, reseat the module(s) one at time in each slot.</li><li>3. Try known good memory from another computer or replace the memory.</li><li>4. Replace the system board.</li></ol> |
| <b>FLASH-ON-ON</b><br>    | System board error       | <ol style="list-style-type: none"><li>1. Reseat the processor.</li><li>2. Replace the system board.</li><li>3. Replace the processor.</li></ol>                                                                                                                                                 |
| <b>FLASH-ON-FLASH</b><br> | display panel error      | <ol style="list-style-type: none"><li>1. Reseat the display cable.</li><li>2. Replace the display panel.</li><li>3. Replace the video card/system board.</li></ol>                                                                                                                              |
| <b>OFF-FLASH-OFF</b>                                                                                         |                          | <ol style="list-style-type: none"><li>1. Install compatible memory modules.</li></ol>                                                                                                                                                                                                           |

|                                                                                                               |                                   |                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              | Memory compatibility error        | <ol style="list-style-type: none"> <li>2. If two modules are installed remove one and test. Try the other module in the same slot and test. Test the other slot with both modules.</li> <li>3. Replace the memory.</li> <li>4. Replace the system board.</li> </ol>                                |
| <b>ON-FLASH-ON</b><br>       | Memory is detected but has errors | <ol style="list-style-type: none"> <li>1. Reseat the memory.</li> <li>2. If two modules are installed remove one and test. Try the other module in the same slot and test. Test the other slot with both modules.</li> <li>3. Replace the memory.</li> <li>4. Replace the system board.</li> </ol> |
| <b>OFF-FLASH-FLASH</b><br>   | Modem error                       | <ol style="list-style-type: none"> <li>1. Reseat the modem.</li> <li>2. Replace the modem.</li> <li>3. Replace the system board.</li> </ol>                                                                                                                                                        |
| <b>FLASH-FLASH-FLASH</b><br> | System board error                | <ol style="list-style-type: none"> <li>1. Replace the system board.</li> </ol>                                                                                                                                                                                                                     |
| <b>FLASH-FLASH-OFF</b><br>   | Option ROM error                  | <ol style="list-style-type: none"> <li>1. Reseat the device.</li> <li>2. Replace the device.</li> <li>3. Replace the system board.</li> </ol>                                                                                                                                                      |
| <b>OFF-ON-OFF</b><br>        | Storage device error              | <ol style="list-style-type: none"> <li>1. Reseat the hard drive and optical drive.</li> <li>2. Test the computer with just the hard drive and just the optical drive.</li> <li>3. Replace the device that is causing the failure.</li> <li>4. Replace the system board.</li> </ol>                 |
| <b>FLASH-FLASH-ON</b><br>  | Video card error                  | <ol style="list-style-type: none"> <li>1. Replace the system board.</li> </ol>                                                                                                                                                                                                                     |

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## Removing and Replacing Parts

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- [Subscriber Identity Module \(SIM\) Card](#)
- [Base Cover](#)
- [Wireless Local Area Network \(WLAN\) Card](#)
- [Hard Drive and Audio Board](#)
- [Speaker](#)
- [Memory](#)
- [Coin-Cell Battery](#)
- [Heat Sink and Fan Assembly](#)
- [Display Panel](#)
- [Palm Rest and Display Assembly](#)
- [Hard Drive Cable Kit](#)
- [Secure Digital \(SD\) Card](#)
- [Battery](#)
- [SIM Card Reader](#)
- [Display Closure Sensor](#)
- [LED Cover](#)
- [Keyboard](#)
- [ExpressCard/SD Card Reader](#)
- [System Board](#)
- [Internal Card With Bluetooth® Wireless Technology](#)
- [Display Bezel](#)
- [Camera](#)


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## Specifications

### Dell™ Vostro™ Service Manual

 **NOTE:** Offerings may vary by region. For more information regarding the configuration of your computer, click **Start→ Help and Support** and select the option to view information about your computer.

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- [Memory](#)
- [Audio](#)
- [ExpressCard](#)
- [Display](#)
- [Touch Pad](#)
- [AC Adapter](#)
- [Environmental](#)

- [Processor](#)
- [Video](#)
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- [Keyboard](#)
- [Battery](#)
- [Physical](#)

| System Information          |                                    |
|-----------------------------|------------------------------------|
| Chipset                     | Mobile Intel® GS45 Express Chipset |
| DRAM bus width              | 64-bit buses                       |
| Processor address bus width | 36 bits                            |
| Flash EPROM                 | SPI 16 Mbits                       |
| PCI bus                     | 32 bits, 33 MHz                    |

| Processor              |                                                                                         |
|------------------------|-----------------------------------------------------------------------------------------|
| Types                  | Intel® Celeron® Ultra Low Voltage (ULV)<br>Intel Core™2 Solo ULV<br>Intel Core2 Duo ULV |
| L2 cache               | Intel Celeron ULV-1MB<br>Intel Core2 Solo ULV-3 MB<br>Intel Core2 Duo ULV-3 MB          |
| External bus frequency | 800 MHz                                                                                 |

| Memory            |                                                                                                             |
|-------------------|-------------------------------------------------------------------------------------------------------------|
| Type              | DDR3 SDRAM                                                                                                  |
| Speed             | 1067 MHz<br><br><b>NOTE:</b> The memory runs at 800 MHz due to the limitations of the Front Side Bus (FSB). |
| Connectors        | one user-accessible SODIMM socket                                                                           |
| Module capacities | 1 GB, 2 GB, and 4 GB                                                                                        |
| Minimum memory    | 1 GB                                                                                                        |
| Maximum memory    | 4 GB                                                                                                        |

| Video                 |                            |
|-----------------------|----------------------------|
| Type                  | Integrated on system board |
| Controller and memory | Intel GMA X4500HD          |
| Output                | 15-pin VGA connector       |

| Audio             |                                                                        |
|-------------------|------------------------------------------------------------------------|
| Type              | two-channel high definition audio                                      |
| Controller        | Realtek ALC269                                                         |
| Stereo conversion | 24-bit (analog-to-digital and digital-to-analog)                       |
| Interface:        |                                                                        |
| Internal          | high definition audio                                                  |
| External          | microphone-in connector, stereo headphones/external speakers connector |
| Speakers          | 1.5 W mono                                                             |



|                            |                                       |
|----------------------------|---------------------------------------|
| Internal speaker amplifier | 1.5 W mono                            |
| Volume controls            | keyboard function keys, program menus |

|                       |                                                                                        |
|-----------------------|----------------------------------------------------------------------------------------|
| <b>Communications</b> |                                                                                        |
| Network adapter       | 10/100/1000 Mbps Ethernet LAN                                                          |
| Wireless              | dedicated WLAN, WWAN, and Bluetooth® wireless support if optional cards are purchased. |

|                                                              |                    |
|--------------------------------------------------------------|--------------------|
| <b>ExpressCard</b>                                           |                    |
| <b>NOTE:</b> The ExpressCard slot does NOT support PC Cards. |                    |
| ExpressCard connector                                        | ExpressCard slot   |
| Cards supported                                              | 34-mm ExpressCards |

|                             |                                                                                |
|-----------------------------|--------------------------------------------------------------------------------|
| <b>Ports and Connectors</b> |                                                                                |
| Audio                       | microphone connector, stereo headphone/ speakers connector                     |
| Video                       | 15-pin VGA connector                                                           |
| Network adapter             | RJ-45 connector                                                                |
| USB                         | one 4-pin USB 2.0-compliant connector, one eSATA/USB 2.0-compliant connector   |
| Memory card reader          | 5-in-1 memory card reader                                                      |
| Mini-Card                   | PCI-E Half-Mini Card support for WLAN<br>PCI-E Full-Mini Card support for WWAN |

|                    |                                           |
|--------------------|-------------------------------------------|
| <b>Display</b>     |                                           |
| Type               | White Light Emitting Diode (WLED) display |
| Size               | 13.3 inch high definition (HD)            |
| Active area (X/Y)  | 293.4 mm x 165.0 mm                       |
| Dimensions:        |                                           |
| Height             | 188.8 mm (7.43 inch)                      |
| Width              | 314.1 mm (12.37 inch)                     |
| Diagonal           | 337.8 mm (13.3 inch)                      |
|                    |                                           |
| Maximum resolution | 1366 x 768 at 262 K colors                |
| Maximum brightness | 200 nits                                  |
| Operating angle    | 0° (closed) to 135°                       |
| Refresh rate       | 60 Hz                                     |
| Viewing angles:    |                                           |
| Horizontal         | 40/40                                     |
| Vertical           | 15/30                                     |
| Pixel pitch        | 0.2148 mm                                 |

|                 |                         |
|-----------------|-------------------------|
| <b>Keyboard</b> |                         |
| Number of keys  | United States: 86 keys  |
|                 | United Kingdom: 87 keys |
|                 | Brazil: 87 keys         |
|                 | Japan: 90 keys          |
| Layout          | QWERTY/AZERTY/Kanji     |

|                 |         |
|-----------------|---------|
| <b>Touchpad</b> |         |
| Active area:    |         |
| X-axis          | 80.0 mm |

|        |         |
|--------|---------|
| Y-axis | 40.7 mm |
|--------|---------|

|                               |                                                                                                                                        |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Battery</b>                |                                                                                                                                        |
| Type                          | 6-cell "smart" lithium-ion (30 WHr)                                                                                                    |
| Charge time with computer off | approximately 4 hours (on a fully discharged battery)                                                                                  |
| Operating time                | battery operating time varies depending on operating conditions and can significantly reduce under certain power-intensive conditions. |
| Life span                     | approximately 300 charge/discharge cycles                                                                                              |
| Dimensions:                   |                                                                                                                                        |
| Depth                         | 155.20 mm (6.11 inch)                                                                                                                  |
| Height                        | 5.65 mm (0.23 inch)                                                                                                                    |
| Width                         | 177.60 mm (6.99 inch)                                                                                                                  |
| Voltage                       | 11.10 VDC                                                                                                                              |
| Temperature range:            |                                                                                                                                        |
| Operating                     | 0 °C to 35 °C (32 °F to 95 °F)                                                                                                         |
| Storage                       | –40 °C to 65 °C (–40 °F to 149 °F)                                                                                                     |
| Coin-cell battery             | 3 V CR2032 lithium                                                                                                                     |

|                         |                                                           |
|-------------------------|-----------------------------------------------------------|
| <b>AC Adapter</b>       |                                                           |
| Type                    |                                                           |
| Input voltage           | 100–240 VAC                                               |
| Input current (maximum) | 1.5 A                                                     |
| Input frequency         | 50–60 Hz                                                  |
| Output current          | 4.34 A (maximum at 4-second pulse)<br>3.34 A (continuous) |
| Output voltage          | 19.5 +/- 1.0 VDC                                          |
| Dimensions:             |                                                           |
| Height                  | 16 mm (0.63 inch)                                         |
| Width                   | 66 mm (2.60 inch)                                         |
| Depth                   | 127 mm (5.00 inch)                                        |
| Temperature range:      |                                                           |
| Operating               | 0° C to 35° C (32° F to 95° F)                            |
| Storage                 | –40 °C to 65 °C (–40 °F to 149 °F)                        |

|                              |                                             |
|------------------------------|---------------------------------------------|
| <b>Physical</b>              |                                             |
| Height (front to back)       | 16.5 mm to 19.7 mm (0.65 inch to 0.78 inch) |
| Width                        | 330 mm (12.99 inch)                         |
| Depth                        | 230 mm (9.05 inch)                          |
| Weight (with 6-cell battery) | <1.6 kg (<3.53 lb)                          |

|                                                                                                       |                                    |
|-------------------------------------------------------------------------------------------------------|------------------------------------|
| <b>Environmental</b>                                                                                  |                                    |
| Temperature range:                                                                                    |                                    |
| Operating                                                                                             | 0° C to 35° C (32° F to 95° F)     |
| Storage                                                                                               | –40° C to 65° C (–40° F to 149° F) |
| Relative humidity (maximum):                                                                          |                                    |
| Operating                                                                                             | 10% to 90% (noncondensing)         |
| Storage                                                                                               | 5% to 95% (noncondensing)          |
| Maximum vibration:                                                                                    |                                    |
| Operating                                                                                             | 0.66 Grms (2–600 Hz)               |
| Storage                                                                                               | 1.30 Grms (2–600 Hz)               |
| <b>NOTE:</b> Vibration is measured using a random-vibration spectrum that simulates user environment. |                                    |
| Maximum shock:                                                                                        |                                    |
| Operating                                                                                             | 142 G (2 ms)                       |
| Storage                                                                                               | 162 G (2 ms)                       |

|                                                                                                    |                                                |
|----------------------------------------------------------------------------------------------------|------------------------------------------------|
| <b>NOTE:</b> Shock is measured with hard drive in head-parked position and a 2-ms half-sine pulse. |                                                |
| Altitude:                                                                                          |                                                |
| Operating                                                                                          | –15.2 m to 3048 m (–50 ft to 10,000 ft)        |
| Storage                                                                                            | –15.2 m to 10,668 m (–50 ft to 35,000 ft)      |
| Airborne contaminant level                                                                         | G2 or lower as defined by ANSI/ISA-S71.04-1985 |

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## Hard Drive and Audio Board

### Dell Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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## Removing the Hard Drive and Audio Board



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).
6. Disconnect the speaker cable from the audio board.
7. Disconnect the hard-drive data cable from the audio board.
8. Remove the screws that secure the audio board and the hard drive to the computer.
9. Lift and remove the hard drive assembly and audio board from the computer.
10. Disengage the audio board from the hard drive.
11. Remove the screws that secure the hard-drive bracket to the hard drive.
12. Remove the hard drive from the hard-drive bracket.

## Replacing the Hard Drive and Audio Board

To replace the hard drive and audio board, perform the above steps in reverse order.

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## Battery

### Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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## Removing the Battery



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Lift the black cable-release clip to release the battery cable from the connector on the system board and disconnect the battery cable.
6. Remove the screws that secure the battery to the computer.
7. Lift the battery up and away from the computer.

## Replacing the Battery

To replace the battery, perform the above steps in reverse order.

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## Internal Card With Bluetooth® Wireless Technology

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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### Removing the Bluetooth Card



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).
6. Remove the [hard drive and audio board](#).
7. Remove the [WLAN card](#).
8. Remove the [LCD cover](#).
9. Remove the [memory](#).
10. Remove the [keyboard](#).
11. Remove the [card reader](#).
12. Remove the [coin-cell battery](#).
13. Remove the [system board](#).
14. Remove the screw that secures the Bluetooth card to the system board.
15. Lift the Bluetooth card up and away from the system board.

### Replacing the Bluetooth Card

To replace the Bluetooth card, perform the above steps in reverse order.

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## Base Cover

### Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

---

## Removing the Base Cover



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the screws that secure the base cover to the computer.
5. Remove the screws that secure the base cover to the back of the computer.
6. Slide the base cover towards the front of the computer.
7. Lift the base cover up and away from the computer.

## Replacing the Base Cover

To replace the base cover, perform the above steps in reverse order.

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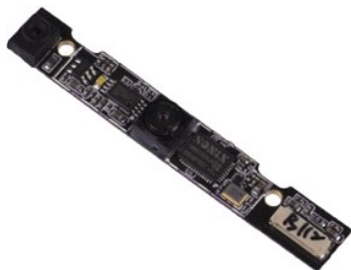
## Camera

### Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

---

## Removing the Camera



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
  2. Remove the [ExpressCard](#), if applicable.
  3. Remove the [SD card](#), if applicable.
  4. Remove the [base cover](#).
  5. Remove the [battery](#).
  6. Remove the [display bezel](#).
  7. Remove the [display panel](#).
  8. Using a plastic scribe, gently pry the camera to release it from the display cover.
- 
9. Disconnect the camera cable from the camera, and remove the camera from the computer.

## Replacing the Camera

To replace the camera, perform the above steps in reverse order.

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## ExpressCard/SD Card Reader

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

---

### Removing the ExpressCard/SD Card Reader



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).
6. Remove the [hard drive and audio board](#).
7. Remove the [WLAN card](#).
8. Remove the [LCD cover](#).
9. Remove the [memory](#).
10. Remove the [keyboard](#).
11. Remove the screws that secure the card reader to the computer.
12. Carefully turn over the computer.
13. Lift the clip that secures the hard-drive data cable to the system board and disconnect it from its connector on the system board.
14. Lift the card reader up and away from the computer.

### Replacing the Card Reader

To replace the card reader, perform the above steps in reverse order.

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## Coin-Cell Battery

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

---

### Removing the Coin-Cell Battery



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).
6. Remove the [hard drive and audio board](#).
7. Remove the [LCD cover](#).
8. Remove the [keyboard](#).
9. Remove the [card reader](#).
10. Remove the tape that secures the coin-cell battery cable to the computer.

11. Disconnect the coin-cell battery cable from the system board.

12. Remove the coin-cell battery and cable from the computer.

### Replacing the Coin-Cell Battery

To replace the coin-cell battery, perform the above steps in reverse order.

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## ExpressCard

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

---

### Removing the ExpressCard



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Press in on the ExpressCard to release it from the computer.
3. Slide the ExpressCard out of the computer.

### Replacing the ExpressCard

To replace the ExpressCard, perform the above steps in reverse order.

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## Display Closure Sensor

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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### Removing the Display Closure Sensor



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).
6. Remove the screw that secures the display closure board to the computer.
7. Carefully slide the white latch to disconnect the flex cable that connects the display closure sensor to the computer.
8. Remove the display closure sensor from the computer.

### Replacing the Display Closure Sensor

To replace the display closure sensor, perform the above steps in reverse order.

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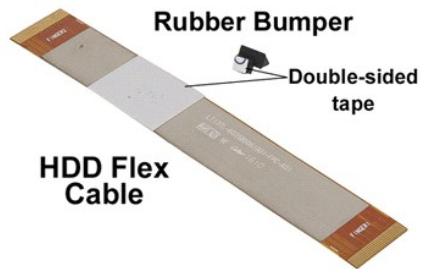
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## Hard Drive Cable Kit

Dell™ Vostro™ 13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

### Installing the Hard Drive Cable Kit

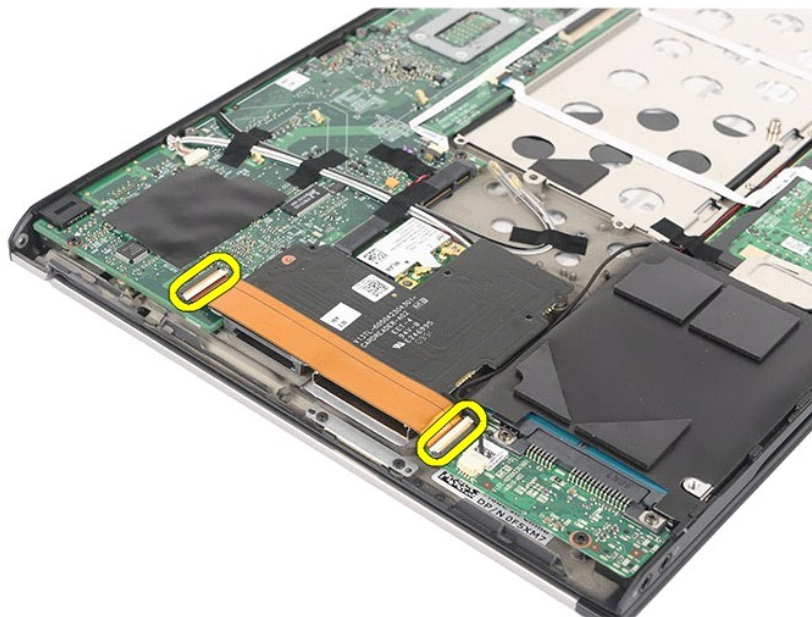


**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

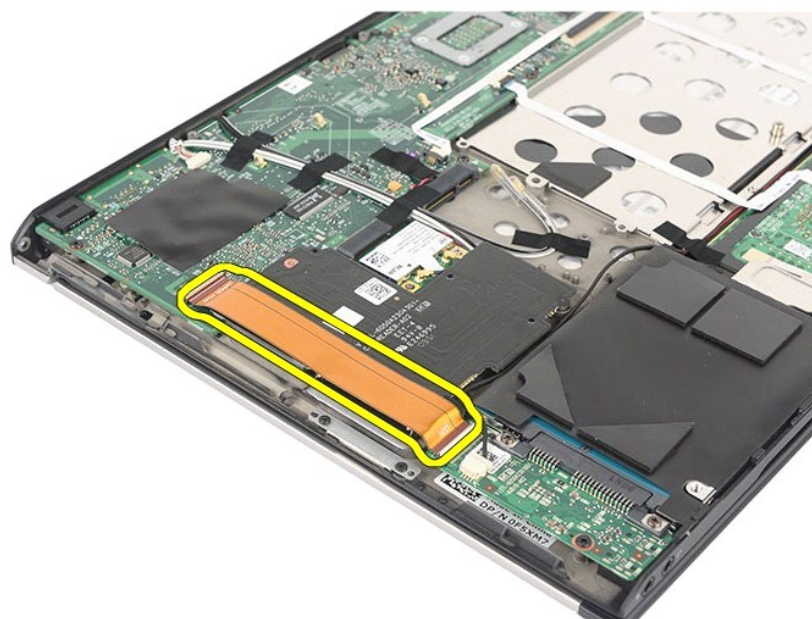
1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).




6. Disconnect both ends of the existing hard drive flex cable from the system board and hard drive connectors.

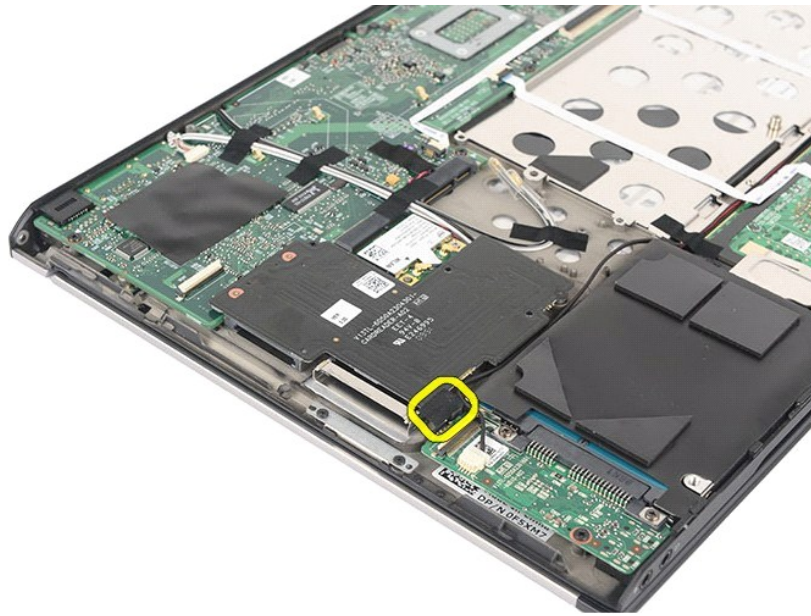


7. The hard drive flex cable is attached with a double sided tape. Peel off the cable from the system.

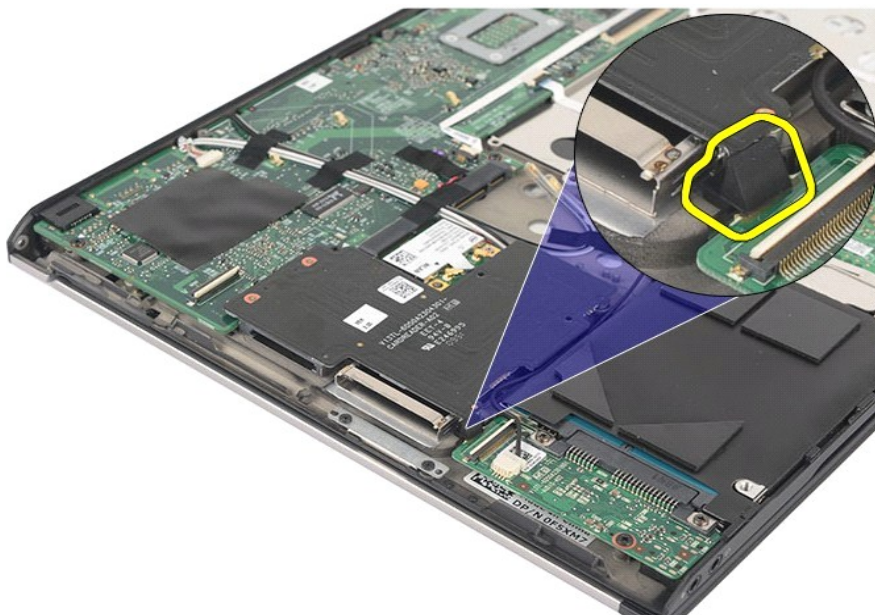


8. Remove the cloth tape from the card reader board edge.

 **NOTE:** Skip this step if the cloth tape is not present.



9. Peel off the double sided tape and attach the rubber bumper to the system.



10. Peel off the double sided tape from the hard drive flex cable. Connect the cable end labeled 'HDD' to the hard drive connector first, follow by connecting the other end to the system board connector.






11. Press down the cable to attach the double sided tape to the card reader board. Using the halo lines on the below picture as a guideline, do not press beyond the suggested line or to the edge of the card reader to prevent unnecessary bent to the flex cable.



11. Re-install back the pre-removal part in reverse order.

 **NOTE:** When replacing the bottom base cover, do not add unnecessary pressure at the hard drive and card reader location. This is to avoid unnecessary cc edge.

Refer to the Bottom [Base Cover](#) replacement procedure for further information.

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## Heat Sink and Fan Assembly

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

---

### Removing the Heat Sink and Fan Assembly



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).
6. Remove the [hard drive and audio board](#).
7. Remove the [WLAN card](#).
8. Remove the [LCD cover](#).
9. Remove the [memory](#).
10. Remove the [keyboard](#).
11. Remove the [card reader](#).
12. Remove the [coin-cell battery](#).
13. Remove the [system board](#).
14. Disconnect the fan cable from the system board.
15. Remove the screws that secure the heat sink and fan assembly to the system board.
16. Lift the heat sink and fan assembly up and away from the system board.

### Replacing the Heat Sink and Fan Assembly

To replace the heat sink and fan assembly, perform the above steps in reverse order.

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## Keyboard

### Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

---

## Removing the Keyboard



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).
6. Remove the [LCD cover](#).
7. Remove the screws that secure keyboard to the computer.
8. Flip over the keyboard and lay it on the palm rest.
9. Carefully lift the white clip to release the keyboard cable.
10. Disconnect the keyboard cable from its connector on the system board.
11. Lift the keyboard up and away from the computer.

## Replacing the Keyboard

To replace the keyboard, perform the above steps in reverse order.

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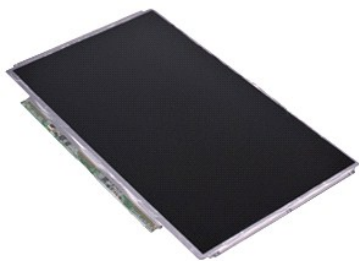
## Display Panel

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

---

### Removing the Display Panel



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [display bezel](#).
6. Remove the screws that secure the display panel to the display cover.
7. Carefully flip the display panel towards the keyboard.
8. Remove the adhesive tape that secures the display-panel cable to the display cover.
9. Remove the display panel from the computer.

### Replacing the Display Panel

To replace the display panel, perform the above steps in reverse order.

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## Display Bezel

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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### Removing the Display Bezel



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the screw covers from the display bezel.
3. Remove the screws that secure the display bezel to the display assembly.
4. Using a plastic scribe, gently pry under the display bezel to release it from the display assembly.
5. Lift the display bezel and remove it from the display assembly.

### Replacing the Display Bezel


To replace the display bezel, perform the above steps in reverse order.

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## Memory


### Dell™ Vostro™ V13 Service Manual

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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## Removing the Memory Module



 **NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
  2. Remove the [ExpressCard](#), if applicable.
  3. Remove the [SD card](#), if applicable.
  4. Remove the [base cover](#).
  5. Remove the [battery](#).
  6. Remove the [LCD cover](#).
  7. Use your fingertips to carefully spread apart the securing clips on each end of the memory module connector until the memory module pops up.
- 
8. Remove the memory module from its connector on the system board, drawing the module from the system board at a 45-degree angle.

## Replacing the Memory Module

1. Place the memory module at a 45-degree angle at the connector on the system board, and align the notch in the module with the tab on the connector.
  2. Press down on the module until it clicks into place. If the module does not click into place, remove the module and reinstall it.
-

## Palm Rest and Display Assembly

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

---

### Removing the Palm Rest and Display Assembly



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).
6. Remove the [hard drive and audio board](#).
7. Remove the [WLAN card](#).
8. Remove the [LCD cover](#).
9. Remove the [memory](#).
10. Remove the [keyboard](#).
11. Remove the [card reader](#).
12. Remove the [coin-cell battery](#).
13. Remove the [system board](#).
14. Remove the screws on the right of the display hinge.
15. Remove the screws on the left of the display hinge to release the display assembly from the palm rest.
16. Release the antennae, camera, and display cables and remove them from the palm rest.
17. Remove the palm rest from the display assembly.

### Replacing the Palm Rest and Display Assembly

To replace the palm rest and display assembly, perform the above steps in reverse order.

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## LED Cover

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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### Removing the LED Cover



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Starting from the right side of the computer, use a plastic scribe to gently pry up the LED cover from the computer chassis.
3. Carefully pull the LED cover toward the keyboard, then flip it up toward the display.
4. Disconnect the LED board cable from its connector on the LED cover.
5. Lift the LED cover up and away from the computer.



### Replacing the LED Cover

To replace the LED cover, perform the above steps in reverse order.

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## Secure Digital (SD) Card


Dell™ Vostro™ V13 Service Manual

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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### Removing the SD Card



 **NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Press in on the SD card to release the SD card from the computer.
3. Slide the SD card out of the computer.

### Replacing the SD Card

To replace the SD card, perform the above steps in reverse order.

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## SIM Card Reader

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

---

### Removing the SIM Card Reader



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).
6. Slide the white latch to disconnect the flex cable from the SIM card reader.
7. Remove the screw that secures the SIM card reader to the computer.
8. Remove the SIM card reader from the computer.

### Replacing the SIM Card Reader

To replace the SIM card reader, perform the above steps in reverse order.

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## Subscriber Identity Module (SIM) Card

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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### Removing the SIM Card



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [battery](#).
3. Remove the [LCD cover](#).
4. Remove the [keyboard](#).
5. Slide the SIM card holder and lift it to release the the SIM card from the SIM card holder.
6. Remove the SIM card from the SIM card holder.

### Replacing the SIM Card

To replace the SIM card, perform the above steps in reverse order.

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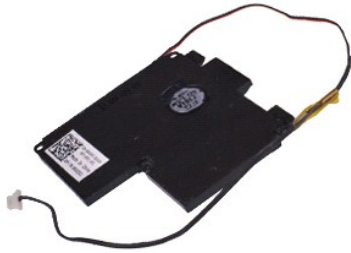
## Speaker

### Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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## Removing the Speaker



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).
6. Remove the [display closure sensor](#).
7. Disconnect the touch-pad cable from its connector on the system board.
8. Remove the tape to release the speaker cable from its routing guide in the computer.
9. Disconnect the speaker cable from the audio board and remove it from its routing guide in the computer.
10. Carefully pull up the flex cable and remove it from the speaker.
11. Remove the screws that secure the speaker to the computer.
12. Lift the speaker up and away from the computer.

## Replacing the Speaker

To replace the speaker, perform the above steps in reverse order.

---

## System Board

### Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

---

## Removing the System Board



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).
6. Remove the [hard drive and audio board](#).
7. Remove the [WLAN card](#).
8. Remove the [LCD cover](#).
9. Remove the [memory](#).
10. Remove the [keyboard](#).
11. Remove the [card reader](#).
12. Remove the [coin-cell battery](#).
13. Pull up the blue tab to disconnect the display cable from the system board.
14. Gently turn over the computer and remove the tape to release the antennae cables from the system board.
15. Disconnect the camera cable from the system board.
16. Disconnect the display status sensor and touch-pad flex cables from the system board.
17. Remove the screws that secure the system board and fan to the computer.
18. Remove the system board from the computer.

## Replacing the System Board

To replace the system board, perform the above steps in reverse order.

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## Wireless Local Area Network (WLAN) Card

Dell™ Vostro™ V13 Service Manual

**WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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### Removing the WLAN Card



**NOTE:** You may need to install Adobe® Flash® Player from [Adobe.com](http://Adobe.com) in order to view the illustrations below.

1. Follow the procedures in [Before Working Inside Your Computer](#).
2. Remove the [ExpressCard](#), if applicable.
3. Remove the [SD card](#), if applicable.
4. Remove the [base cover](#).
5. Remove the [battery](#).
6. Remove the antenna cables from the WLAN card.
7. Remove the screw that secures the WLAN card to the system board.
8. Gently pry the WLAN card from the system board.
9. Pull the WLAN card away from its connector on the system board and remove it from the computer.

### Replacing the WLAN Card

To replace the WLAN Card, perform the above steps in reverse order.

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# Working on Your Computer


## Dell™ Vostro™ V13 Service Manual


- [Before Working Inside Your Computer](#)
  - [Recommended Tools](#)
  - [Turning Off Your Computer](#)
  - [After Working Inside Your Computer](#)
- 


## Before Working Inside Your Computer


Use the following safety guidelines to help protect your computer from potential damage and to help to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that the following conditions exist:


- 1 You have performed the steps in [Working on Your Computer](#).
- 1 You have read the safety information that shipped with your computer.
- 1 A component can be replaced or--if purchased separately--installed by performing the removal procedure in reverse order.

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

 **CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

 **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface, such as a connector on the back of the computer.


 **CAUTION:** Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

 **CAUTION:** When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.


 **NOTE:** The color of your computer and certain components may appear differently than shown in this document.

To avoid damaging your computer, perform the following steps before you begin working inside the computer.


1. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
2. Turn off your computer (see [Turning Off Your Computer](#)).
3. If the computer is connected to a docking device (docked), undock it.


 **CAUTION:** To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.

4. Disconnect all network cables from the computer.
5. Disconnect your computer and all attached devices from their electrical outlets.
6. Close the display and turn the computer upside-down on a flat work surface.

 **CAUTION:** To avoid damaging the system board, you must remove the main battery before you service the computer.

7. Remove the main battery (see [Battery](#)).
8. Turn the computer top-side up.
9. Open the display.
10. Press the power button to ground the system board.

 **CAUTION:** To guard against electrical shock, always unplug your computer from the electrical outlet before opening the display.

 **CAUTION:** Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.

11. Remove any installed ExpressCards or Smart Cards from the appropriate slots.
12. Remove the hard drive (see [Hard Drive](#)).

## Recommended Tools

The procedures in this document may require the following tools:


- 1 Small flat-blade screwdriver
- 1 #0 Phillips screwdriver
- 1 #1 Phillips screwdriver
- 1 Small plastic scribe
- 1 Flash BIOS update program CD

## Turning Off Your Computer

 **CAUTION:** To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.

1. Shut down the operating system:

1 In Windows Vista®:

Click **Start** , then click the arrow in the lower-right corner of the **Start** menu as shown below, and then click **Shut Down**.



1 In Windows® XP:

Click **Start**→ **Turn Off Computer**→ **Turn Off**.

The computer turns off after the operating system shutdown process is complete.

2. Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.


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## After Working Inside Your Computer

After you complete any replacement procedure, ensure you connect any external devices, cards, and cables before turning on your computer.

 **CAUTION:** To avoid damage to the computer, use only the battery designed for this particular Dell computer. Do not use batteries designed for other Dell computers.

1. Connect any external devices, such as a port replicator, battery slice, or media base, and replace any cards, such as an ExpressCard.

 **CAUTION:** To connect a network cable, first plug the cable into the network device and then plug it into the computer.

2. Connect any telephone or network cables to your computer.
3. Replace the [battery](#).
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.

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